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TITLE OF INVENTION

SLOPE MASTER.

The Slope Master is used to detect the grade on all slopes in highway construction using a degree gauge. Example: 2 to 1 equals  $26\frac{1}{2}$  degrees.

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This application claims the benefit of the filing date of Provisional Application Number 60/271,749, dated 2/27/2001.

## SKETCHES

FIG. 1; FIG. 2; FIG. 3; FIG. 4; FIG. 4; FIG. 6.

## FIELD OF INVENTION

### Highway Grade Instrument

The present invention relates to highway grading and more particularly to grading slopes with minimum time needed.

## BACKGROUND OF THE INVENTION

Conventional grade prep practice for cutting slopes is often very costly and time consuming. Stakes have to be inserted into the ground manually and constantly removed and repeated versus laser methods which are extremely costly and require the machine in use to operate slowly to pick up signals.

Obviously, the methods discussed above cause frustration for machine operators and laborers, as well as costliness for the companies.

Therefore, there continues to be a need for a better process for grading slopes.

## SUMMARY AND OBJECTS OF THE INVENTION

The present invention relates to a highway grade instrument that grades slopes with minimum time involved.

The highway grade instrument of the present invention includes a degree scale.

A function component, glycerin acting as a stabilizer provides character to the invention.

Another feature, the magnetized base makes the invention versatile from machine to machine.

Other objects and advantages will become apparent and obvious from a study of the following description and the accompanying drawings which are merely illustrative of such invention.

## BRIEF DESCRIPTION OF THE DRAWINGS

- Figure '1', Front View: Drawing shows the front view of the Slopemaster in it's assembled state, and referencing the engraved plate with number.
- Figure '2', Slope Arm Assembly: Drawing shows a side view of the housing, referencing the 'Slope Arm and it's means of attachment to housing.
- Figure '3', Housing and Base Assembly: Drawing references some of housing and base components and illustrates attachment of housing to base.
- Figure '4', FacePlate Assembly: Drawing details components of faceplate assembly that inserts into housing.
- Figure '5', Slope Indicator Detail: Illustrates position and assembly of slope indicator on faceplate.
- Figure '6', Bottom of Base Detail: References magnets and foam padding on bottom of base.

## DETAILED DESCRIPTION OF THE INVENTION

The Slopemaster is mounted to a Base Assembly made up of two high density plastic rectangles, cemented together. The upper rectangle **18** measures 4.375 inches square by 1 inch high and is cemented and screwed to the lower rectangle **19**. Rectangle **19** measures 5.0 square by .625 in. high. The bottom of the base has two strips cut .375 in. deep where two ceramic magnets **25, 26** are cemented into base so as to be flush with bottom. A .062 in. thick foam rubber pad **20** is glued to bottom of base to prevent scratching of metal when Slopemaster is attached (by magnetic base), to vehicle body. The housing **8** is attached to the base by means of a .375 in. zinc-plated threaded rod **11**, using a zinc-plated coupling nut **17**, to form a separation between housing and base. The threaded rod is attached to the base by means of a flat washer **14**, a lock washer **15**, and a .375 in. nut **12**. The rod is attached to the housing by means of a flat washer **13**, and a .375 in. nut **16**. The housing **8** prototype is a PVC cap for 4 in. service pipe. In the interior of the housing, a 1.187 in. wide section of 4 in. PVC pipe **10** is cemented to the interior wall as a stop for the Faceplate Assembly. The threaded rod which holds attaches the housing to the base also goes through this stop. In the center of the upper wall of the housing is a .218 in. hole that lines up with the hole in section 4 Faceplate assembly. This is the hole used to insert the glycerin that will serve as ballast for the indicator. A setscrew **9** is inserted in threaded hole as a plug after the glycerin is injected. The Faceplate Assembly is a six-part assembly, starting at the rear with a 4 in. knockout plug **6**, which is cemented with silicon to the stop **10**, to form a watertight seal. Attached, also by silicone, to the front of the knock-out plug, is the dial face, which consists of an aluminum back **5**, with a vinyl printed self-adhesive decal **29**, that bears the logo and the angle register marks. These marks, at five-degree intervals, will line up with the exterior slope arm to show angle of blade on grader. The next piece in the assembly is .468 section of PVC **4** cemented to dial face and sides of housing.

There is a whole **7** in the top of this piece that lines up with the hole in the housing wall and allows the injection of 96% Natural Glycerin, after assembly. Cemented to the front of **4**, is a cork gasket **3**, which is also cemented with silicone and helps to seal the area where the glycerin will be maintained. Next cemented, to the front side of the cork ring, is a piece of .093 in. thick Plexiglas **2** to allow viewing of the dial face while containing the glycerin. The glycerin is important because it stabilizes the indicator arrow without the use of any counterweights or attached fins or paddles. The glycerin steadies the indicator arrow while the Slopemaster is in motion. This has been tested and proven positive in the field. The front piece in the assembly is a .125 section of PVC **1**, which is cemented with silicon to the Plexiglas and the interior of the housing, completing the seal. The Indicator Arrow **27** is a brass-tooled arrow attached to the dial face **5** by a small brass bolt **28** and bound by two brass nuts **30,31** one on each side of the dial face and vinyl decal.

The Slope Arm **21** is attached to the housing by a brass bolt **22**, a brass nut **23**, and a brass wingnut **24**. The wingnut allows easy adjustment of the Slope Arm, which is lined up with the appropriate degree mark on the dial face to give correct slope angle to grader. On the front of the upper portion of the base is attached, with self-adhesive backing, an engraved plate **32**, with degrees of angles needed to maintain the five most desired slopes while grading. This invention is successful because it utilizes the smallest number of parts possible in this application, thereby reducing faults and repairs. The indicator works as a gravity powered plumbbob, with very little room for error, as the slope arm is lined up with the plumbbob to produce desired slope.